Chemical Analysis Report

SO-DIST-2020-09-10-01

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **2020 SMP : Cow Slough**
Request ID: **RQ-2020-09-07-49**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
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FLDEP South District Office
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Date Certified: 29-SEP-2020 11:46

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Cow Slough @ Farabee Rd **Collection Date/Time: 09/09/2020 09:10**

Field ID: G3SD0160 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2195268	EPA 180.1 Rev. 2.0	Turbidity	12		NTU	P387217	
	EPA 300.0 Rev. 2.1	Chloride	25		mg Cl/L	P387417	
		Sulfate	24		mg SO4/L	P387419	
	SM 2120 B-2011	Color (true)	330		PCU	P387220	
	SM 2320 B-2011	Total Alkalinity	38		mg CaCO3/L	P387352	
	SM 2540 C-2011	TDS	171		mg/L	P387620	
	SM 2540 D-2011	TSS	14		mg/L	P387624	
	SM 4500 F-C-2011	Fluoride	0.12		mg F/L	P387354	
2195269	EPA 350.1 Rev. 2.0	Ammonia-N	0.060		mg N/L	P387296	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P387325	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.073		mg N/L	P387336	
	EPA 365.1 Rev. 2.0	Total-P	0.18		mg P/L	P387670	
	SM 5310 B-2011	Organic Carbon	24		mg C/L	P387313	
2195270	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.097		mg P/L	P387232	
2195273	EPA 200.7 Rev. 4.4	Barium	24.2		ug/L	P387343	
		Calcium	19.8		mg/L	P387343	
		Iron	1.40E+03		ug/L	P387343	
		Magnesium	6.15		mg/L	P387343	
		Potassium	4.7		mg/L	P387343	
		Sodium	12.6		mg/L	P387343	
		Zinc	5.0	U	ug/L	P387343	
	EPA 200.8 Rev. 5.4	Aluminum	428		ug/L	P387343	
		Antimony	0.080	I	ug/L	P387343	
		Arsenic	1.02		ug/L	P387343	
		Beryllium	0.040	I	ug/L	P387343	
		Boron**	36.1		ug/L	P387343	
		Cadmium	0.020	U	ug/L	P387343	
		Chromium	0.98	I	ug/L	P387343	
		Copper	1.82		ug/L	P387343	
		Lead	0.36	I	ug/L	P387343	
		Nickel	0.65	I	ug/L	P387343	
		Selenium	0.20	U	ug/L	P387343	
		Silver	0.010	U	ug/L	P387343	
		Thallium	0.10	U	ug/L	P387343	
	SM 2340B	Hardness	74.8		mg/L	P387343	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P387217

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P387343

Component	Result	Code	Units
Barium	1.0	U	ug/L
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P387343

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Beryllium	0.010	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387417

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387419

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387296

Component	Result	Code	Units
Ammonia-N	0.002	U	mg N/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P387325

Component	Result	Code	Units
Kjeldahl Nitrogen	0.080	U	mg N/L

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387336

Component	Result	Code	Units
NO2NO3-N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P387670

Component	Result	Code	Units
Total-P	0.002	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387232

Component	Result	Code	Units
O-Phosphate-P	0.004	U	mg P/L

Reference Method: SM 2120 B-2011
Batch ID: P387220

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P387352

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO3/L

Reference Method: SM 2540 C-2011
Batch ID: P387620

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P387624

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P387354

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P387313

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P387343

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	98.2		P	85 - 115
Calcium	99.3		P	85 - 115
Iron	96.3		P	85 - 115
Magnesium	96.9		P	85 - 115
Potassium	94.7		P	85 - 115
Sodium	95.3		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P387343

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	92.3		P	85 - 115
Antimony	100		P	85 - 115
Arsenic	97.0		P	85 - 115
Beryllium	109		P	85 - 115
Boron	90.9		P	85 - 115
Cadmium	96.2		P	85 - 115
Chromium	96.3		P	85 - 115
Copper	97.4		P	85 - 115
Lead	99.2		P	85 - 115
Nickel	96.1		P	85 - 115
Selenium	95.7		P	85 - 115
Silver	96.2		P	85 - 115
Thallium	100		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387417

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	94.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387419

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	94.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387296

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P387325

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	103		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387336

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P387670

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	107		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387232

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.5		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P387220

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.6		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P387352

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P387354

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.1		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P387313

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.8		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P387343

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2194770	Barium	100	101	P/P	80 - 120
2194770	Calcium	87.3		P	80 - 120
2194770	Iron	100	99.8	P/P	80 - 120
2194770	Magnesium	98.9	99.4	P/P	80 - 120
2194770	Potassium	104	104	P/P	80 - 120
2194770	Sodium	98.3	99.2	P/P	80 - 120
2194770	Zinc	103	103	P/P	80 - 120
2195378	Barium	102		P	80 - 120
2195378	Calcium	99.1		P	80 - 120
2195378	Iron	103		P	80 - 120
2195378	Magnesium	97.2		P	80 - 120
2195378	Potassium	96.0		P	80 - 120
2195378	Sodium	95.5		P	80 - 120
2195378	Zinc	108		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P387343

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2194770	Aluminum	91.3	93.1	P/P	80 - 120
2194770	Antimony	104	105	P/P	80 - 120
2194770	Arsenic	99.1	100	P/P	80 - 120
2194770	Beryllium	107	105	P/P	80 - 120
2194770	Boron	92.4	95.1	P/P	80 - 120
2194770	Cadmium	99.3	98.9	P/P	80 - 120
2194770	Chromium	98.4	98.9	P/P	80 - 120
2194770	Copper	97.3	97.2	P/P	80 - 120
2194770	Lead	99.2	100	P/P	80 - 120
2194770	Nickel	96.8	96.9	P/P	80 - 120
2194770	Selenium	97.7	96.9	P/P	80 - 120
2194770	Silver	96.8	95.6	P/P	80 - 120
2194770	Thallium	102	105	P/P	80 - 120
2195378	Aluminum	92.2		P	80 - 120
2195378	Antimony	104		P	80 - 120
2195378	Arsenic	101		P	80 - 120
2195378	Beryllium	108		P	80 - 120
2195378	Boron	94.1		P	80 - 120
2195378	Cadmium	100		P	80 - 120
2195378	Chromium	99.2		P	80 - 120
2195378	Copper	98.0		P	80 - 120
2195378	Lead	100		P	80 - 120
2195378	Nickel	97.0		P	80 - 120
2195378	Selenium	96.4		P	80 - 120
2195378	Silver	94.6		P	80 - 120
2195378	Thallium	103		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387417

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2195220	Chloride	95.8		P	90 - 110
2195337	Chloride	92.0		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387419

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2195220	Sulfate	95.3		P	90 - 110
2195337	Sulfate	93.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387296

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2195236	Ammonia-N	98.0	99.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387336

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2195221	NO2NO3-N	95.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P387670

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2195049	Total-P	108	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387232

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2195301	O-Phosphate-P	97.7	98.9	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P387354

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2195370	Fluoride	96.3	96.3	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P387313

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2195298	Organic Carbon	97.9	99.3	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P387217

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195220	Turbidity	2.09	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P387343

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2194770	Barium	0.329	Spike	P	0 - 20
2194770	Calcium	0.748	Spike	P	0 - 20
2194770	Iron	0.332	Spike	P	0 - 20
2194770	Magnesium	0.319	Spike	P	0 - 20
2194770	Potassium	0.163	Spike	P	0 - 20
2194770	Sodium	0.617	Spike	P	0 - 20
2194770	Zinc	0.104	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P387343

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2194770	Aluminum	1.93	Spike	P	0 - 20
2194770	Antimony	0.515	Spike	P	0 - 20
2194770	Arsenic	1.03	Spike	P	0 - 20
2194770	Beryllium	2.11	Spike	P	0 - 20
2194770	Boron	2.65	Spike	P	0 - 20
2194770	Cadmium	0.378	Spike	P	0 - 20
2194770	Chromium	0.528	Spike	P	0 - 20
2194770	Copper	0.117	Spike	P	0 - 20
2194770	Lead	1.01	Spike	P	0 - 20
2194770	Nickel	0.0551	Spike	P	0 - 20
2194770	Selenium	0.832	Spike	P	0 - 20
2194770	Silver	1.21	Spike	P	0 - 20
2194770	Thallium	2.74	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387417

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195337	Chloride	0.294	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387419

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195337	Sulfate	0.431	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387296

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195236	Ammonia-N	0.944	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P387325

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195132	Kjeldahl Nitrogen	1.05	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387336

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195221	NO2NO3-N	0.198	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P387670

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195049	Total-P	2.26	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387232

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195301	O-Phosphate-P	1.08	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P387220

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195220	Color (true)	2.83	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P387352

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195370	Total Alkalinity	2.53	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P387620

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2194755	TDS	1.58	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P387354

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195370	Fluoride	0.0	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P387313

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195298	Organic Carbon	0.810	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report
Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A100910
Included Lab Sample IDs: 2195268

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	100	P/P	95 - 105

Reference Method: SM 2120 B-2011
Run ID: A100911
Included Lab Sample IDs: 2195268

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.5	99.2	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A100920
Included Lab Sample IDs: 2195270

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.6	99.1	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A100944
Included Lab Sample IDs: 2195269

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	94.3	97.8	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A100952
Included Lab Sample IDs: 2195269

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.5	95.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A100959
Included Lab Sample IDs: 2195269

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	100	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A100972
Included Lab Sample IDs: 2195268

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	99.1	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A100972
Included Lab Sample IDs: 2195268

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	100	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A100980
Included Lab Sample IDs: 2195268

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	101	P/P	90 - 110
Sulfate	100	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A100990
Included Lab Sample IDs: 2195269

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	105	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A100997
Included Lab Sample IDs: 2195273

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	103	99.7	P/P	90 - 110
Calcium	95.7	95.6	P/P	90 - 110
Iron	95.1	94.6	P/P	90 - 110
Magnesium	94.9	94.6	P/P	90 - 110
Potassium	93.3	92.5	P/P	90 - 110
Sodium	94.3	93.5	P/P	90 - 110
Zinc	105	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A101063
Included Lab Sample IDs: 2195273

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	93.9	94.6	P/P	90 - 110
Antimony	102	102	P/P	90 - 110
Arsenic	94.0	93.9	P/P	90 - 110
Boron	92.9	93.6	P/P	90 - 110
Cadmium	93.6	94.3	P/P	90 - 110
Chromium	91.9	93.4	P/P	90 - 110
Copper	92.5	93.3	P/P	90 - 110
Lead	94.5	95.0	P/P	90 - 110
Nickel	92.2	92.1	P/P	90 - 110
Selenium	92.7	92.2	P/P	90 - 110
Silver	95.9	96.2	P/P	90 - 110
Thallium	95.0	94.3	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A101086
Included Lab Sample IDs: 2195273

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Beryllium	101	99.5	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A101161
Included Lab Sample IDs: 2195269

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	101	P/P	85 - 115

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						2.09	
EPA 200.7 Rev. 4.4	Barium	98.2	100	101	102			0.329
	Calcium	99.3	87.3	99.1				0.748
	Iron	96.3	100	99.8	103			0.332
	Magnesium	96.9	98.9	99.4	97.2			0.319
	Potassium	94.7	104	104	96.0			0.163
	Sodium	95.3	98.3	99.2	95.5			0.617
	Zinc	101	103	103	108			0.104
EPA 200.8 Rev. 5.4	Aluminum	92.3	91.3	93.1	92.2			1.93
	Antimony	100	104	105	104			0.515
	Arsenic	97.0	99.1	100	101			1.03
	Beryllium	109	107	105	108			2.11
	Boron	90.9	92.4	95.1	94.1			2.65
	Cadmium	96.2	99.3	98.9	100			0.378
	Chromium	96.3	98.4	98.9	99.2			0.528
	Copper	97.4	97.3	97.2	98.0			0.117
	Lead	99.2	99.2	100	100			1.01
	Nickel	96.1	96.8	96.9	97.0			0.0551
	Selenium	95.7	97.7	96.9	96.4			0.832
	Silver	96.2	96.8	95.6	94.6			1.21
	Thallium	100	102	105	103			2.74
EPA 300.0 Rev. 2.1	Chloride	94.7	92.0	95.8			0.294	
	Sulfate	94.5	93.4	95.3			0.431	
EPA 350.1 Rev. 2.0	Ammonia-N	97.8	98.0	99.3				0.944
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103						1.05
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	95.2					0.198
EPA 365.1 Rev. 2.0	Total-P	107	108	106				2.26
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.5	97.7	98.9				1.08
SM 2120 B-2011	Color (true)	98.6					2.83	
SM 2320 B-2011	Total Alkalinity	103					2.53	
SM 2540 C-2011	TDS						1.58	
SM 4500 F-C-2011	Fluoride	98.1	96.3	96.3				0.0
SM 5310 B-2011	Organic Carbon	97.8	97.9	99.3				0.810

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2195268
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2195273
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2195273
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2195268
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2195268
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2195269
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2195269
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2195269
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2195269
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2195270
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2195268
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2195268
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2195273

Reference Method Descriptions

Method	Description	Associated Samples
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2195268
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2195268
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2195268
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2195269

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	09/10/2020			09/10/2020 15:02	Yen Ta	2195268
EPA 200.7 Rev. 4.4	09/10/2020	09/14/2020 15:10	Elliott D. Healy	09/15/2020 17:14	Betina Topolski	2195273
EPA 200.8 Rev. 5.4	09/10/2020	09/14/2020 15:10	Elliott D. Healy	09/17/2020 19:27	Alexander Thompson	2195273
	09/10/2020	09/14/2020 15:10	Elliott D. Healy	09/18/2020 11:36	Alexander Thompson	2195273
EPA 300.0 Rev. 2.1	09/10/2020			09/15/2020 17:46	Lipi Saha	2195268
EPA 350.1 Rev. 2.0	09/10/2020			09/12/2020 15:30	Ping Hua	2195269
EPA 351.2 Rev. 2.0	09/10/2020	09/14/2020 12:35	David Boose	09/15/2020 12:40	Elliott Rodriguez	2195269
EPA 353.2 Rev. 2.0	09/10/2020			09/14/2020 09:32	Beverly Y. Sanders	2195269
EPA 365.1 Rev. 2.0	09/10/2020	09/22/2020 11:37	Yen Ta	09/23/2020 14:42	Benjamin T. Nordmann	2195269
EPA 365.1 Rev. 2.0 dissolved	09/10/2020			09/10/2020 15:34	Virginia P. Brown	2195270
SM 2120 B-2011	09/10/2020			09/10/2020 16:09	Benjamin T. Nordmann	2195268
SM 2320 B-2011	09/10/2020			09/11/2020 17:17	Dale L. Simmons	2195268
SM 2340B	09/10/2020			09/15/2020 17:14	Betina Topolski	2195273
SM 2540 C-2011	09/10/2020			09/14/2020 15:06	Yijie Li	2195268
SM 2540 D-2011	09/10/2020			09/14/2020 15:06	Yijie Li	2195268
SM 4500 F-C-2011	09/10/2020			09/11/2020 17:17	Dale L. Simmons	2195268
SM 5310 B-2011	09/10/2020			09/11/2020 20:51	David Boose	2195269